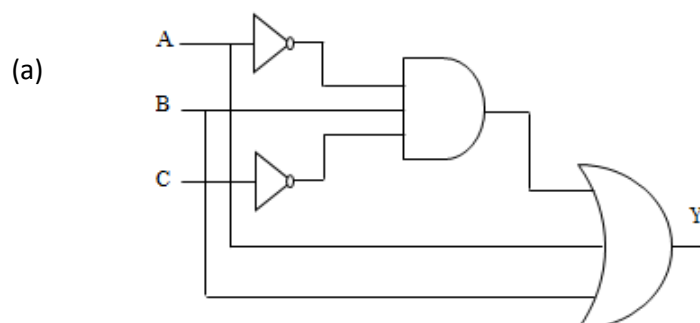
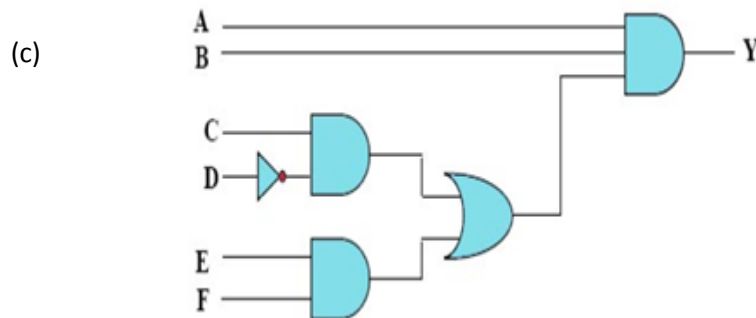
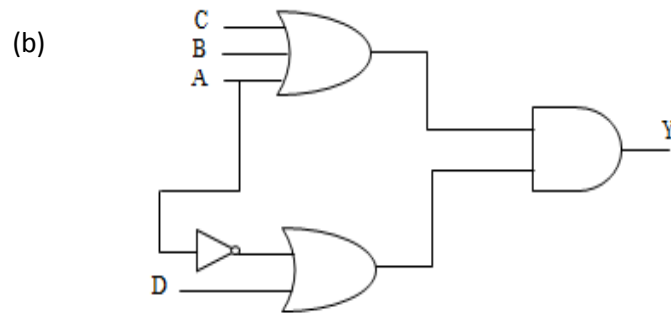


Sheet (3)

- 1- Explain the main difference between ladder diagram and relay logic diagram.
- 2- Explain the usage of internal bits used in application memory.
- 3- What is meant by internal outputs?
- 4- The user memory or application memory consists of data table area and user program area. Explain the content and usage of data table area.
- 5- Draw a ladder diagram program that will cause output D to go true when switch A and switch B are closed or when switch C is closed.
- 6- Draw a ladder diagram program that will cause output D to be on when push button A is on. Or either B or C is on.
- 7- Draw the ladder diagram that implement the following logic expressions:
 - a. $Y = A' B' + B (A + C)$
 - b. $Y = (A + B)(C' + D)$
 - c. $Y = A + B (C + D)'$
 - d. $Y = A' C' + A C D + A B' D'$
 - e. $Y = A' B' + B (A + C)$
 - f. $Y = (A + B)(C' + D)$
- 8- Draw the ladder diagram that is equivalent to the following logic circuit:





9- Draw the ladder diagram for a circuit that operates as follows:

- The main switch (MSW) is the emergency stop switch, which is normally closed.
- When the red pushbutton (PBR) is pressed, the red pilot light turns on and stays on and stays on until MSW is opened.
- When the green pushbutton (PBG) is pressed, white and green pilot lights turn on and stay on until MSW is opened.

10- Draw the ladder diagram for a circuit that operates as follows:

- The main switch (MSW) is the emergency stop switch, which is normally closed.
- When the red pushbutton (PBR) is pressed, the red pilot light and motor one (M1) are energized. They will stay on until MSW is opened.
- When the green pushbutton (PBG) is closed, both white and green pilot lights turn on, and motor one (M1) and motor two (M2) will run. They will stay on until MSW is opened.